

WHAT IS CLAIMED IS:

- 1 1. A system for electronic communication management comprising:
2 a contact center configured to send and receive communications;
3 a modeling engine configured to analyze received communications and
4 determine an intent of a received communication;
5 an adaptive knowledge base configured to store models; and
6 a feedback module configured to analyze responses to the received
7 communications and provide feedback to the modeling engine,
8 which uses the feedback to update the models in the adaptive
9 knowledge base.
- 1 2. The system of claim 1, wherein the contact center is configured to send
2 and receive communications via text-based communication channels.
- 1 3. The system of claim 1, wherein the contact center is configured to send
2 and receive communications via a voice-based communication channel.
- 1 4. The system of claim 1, wherein the contact center is configured to receive
2 text communications containing natural language.
- 1 5. The system of claim 4, wherein the modeling engine includes a natural
2 language processor configured to analyze the text communications to identify
3 concepts.

1 6. The system of claim 5, wherein the natural language processor performs
2 a morphological analysis of the text communications.

1 7. The system of claim 5, wherein the natural language processor performs
2 a semantic analysis of the text communications.

1 8. The system of claim 5, wherein the natural language processor includes
2 a lexical knowledge base.

1 9. The system of claim 1, further comprising an automatic response module
2 that generates the responses to the received communications.

1 10. The system of claim 1, wherein the responses to the received
2 communications are generated by agents.

1 11. The system of claim 1, wherein the contact center converts received
2 communications into a universal data model format.

1 12. The system of claim 1, further comprising an audit module that monitors
2 responses generated by agents for quality.

1 13. The system of claim 12, wherein the audit module produces an audit
2 result that is fed back to the modeling engine.

1 14. The system of claim 1, wherein each of the models in the adaptive
2 knowledge base includes an accuracy gauge that is updated by feedback.

1 15. The system of claim 14, wherein the adaptive knowledge base includes
2 models for active concepts and models for inactive concepts.

1 16. The system of claim 15, wherein the models for active concepts become
2 inactive when they have a sufficiently low accuracy rating.

1 17. The system of claim 15, wherein the models for inactive concepts become
2 active when they have a sufficiently high accuracy rating.

1 18. The system of claim 1, wherein the models in the adaptive knowledge
2 base are organized into categories and the categories are associated with
3 branches.

1 19. The system of claim 18, wherein the modeling engine modifies the
2 branches in the adaptive knowledge base using the feedback from the feedback
3 module.

1 20. The system of claim 18, wherein hierarchies of the branches in the
2 adaptive knowledge base are created manually.

1 21. The system of claim 18, wherein hierarchies of the branches in the
2 adaptive knowledge base are created automatically.

1 22. The system of claim 18, wherein the branches in the adaptive knowledge
2 base have associated rules.

1 23. The system of claim 1, wherein the modeling engine includes a statistical
2 modeler that creates the models and performs relationship algebra using the
3 models.

1 24. The system of claim 1, wherein the modeling engine automatically
2 retrieves data based on the intent of the received communication.

1 25. The system of claim 24, wherein an automatic response module
2 supported by the modeling engine generates a response to the received
3 communication using the retrieved data.

1 26. The system of claim 24, wherein an agent composes a response to the
2 received communication using the retrieved data.

1 27. The system of claim 1, wherein the modeling engine supports an
2 application specific module.

1 28. The system of claim 27, wherein the application specific module is an
2 automatic response module.

1 29. The system of claim 27, wherein the application specific module is an
2 expertise routing module.

1 30. The system of claim 27, wherein the application specific module is an
2 automatic task prioritization module.

1 31. The system of claim 27, wherein the application specific module is a
2 content filter module that filters content of agent-generated responses.

1 32. The system of claim 27, wherein the application specific module is a
2 business process automation module.

1 33. The system of claim 27, wherein the application specific module is a
2 workflow application.

1 34. The system of claim 27, wherein the application specific module is a
2 Frequently Asked Questions module.

1 35. The system of claim 27, wherein the application specific module generally
2 classifies the received communications according to content.

1 36. The system of claim 2, further comprising a digital signal processing
2 module configured to process received voice communications.

1 37. The system of claim 36, wherein the digital signal processing module
2 categorizes the received voice communications according to acoustical content
3 of the received voice communications.

1 38. The system of claim 1, wherein the feedback module is further configured
2 to support multiple feedbacks to a single received communication.

1 39. The system of claim 1, wherein the received communications include
2 documents.

1 40. The system of claim 39, wherein a statistical matching value between the
2 documents and the models is evaluated by a calculated statistical likelihood
3 value.

1 41. A method for electronic communication management, comprising the
2 steps of:
3 receiving a communication;
4 analyzing the communication to determine an intent;
5 predicting a response to the communication based on the intent,
6 producing a predicted response;
7 preparing a response to the communication, producing an actual
8 response; and
9 comparing the actual response to the predicted response to improve
10 subsequent predictions.

1 42. The method of claim 41, further comprising the step of routing the
2 communication based on semantical content of the communication.

1 43. The method of claim 41, wherein the communication is expressed in
2 natural language.

1 44. The method of claim 41, wherein the step of predicting a response to the
2 communication includes comparing the communication to a model.

1 45. The method of claim 41, wherein the step of preparing a response is
2 performed by an automatic response module.

1 46. The method of claim 41, wherein the step of preparing a response is
2 performed by an agent.

1 47. The method of claim 41, wherein the communication is a text
2 communication containing natural language.

1 48. The method of claim 47, wherein the step of analyzing the
2 communication includes morphological analysis and semantic analysis.

1 49. The method of claim 41, wherein the step of predicting a response to the
2 communication includes comparing the communication to a set of models that
3 corresponds to a category related to the intent.

1 50. The method of claim 41, wherein the step of comparing the actual
2 response and the predicted response produces feedback that is used to modify
3 a model.

1 51. The method of claim 50, where if the actual response is substantially the
2 same as the predicted response, the feedback is positive, and if the actual
3 response is substantially different from the predicted response, the feedback is
4 negative.

1 52. The method of claim 41, wherein the communication is a voice
2 communication expressed in natural language.

1 53. The method of claim 52, wherein the step of analyzing the
2 communication includes digital signal processing of the voice communication.

1 54. The method of claim 53, wherein the step of predicting a response to the
2 communication includes categorizing the voice communication based on
3 acoustical content of the voice communication.

1 55. A method for processing a relationship event, comprising the steps of:
2 receiving the relationship event;
3 analyzing the relationship event to identify concepts in the relationship
4 event;
5 building an event model of the relationship event using the concepts;
6 mapping the event model to models in a knowledge base to produce
7 category scores; and
8 routing the relationship event for action based on the category scores.

1 56. A computer-readable medium having embodied thereon a program, the
2 program being executable by a computer to perform method steps for electronic
3 communication management, the method steps comprising:
4 receiving a communication;
5 analyzing the communication to determine intent;
6 predicting a response to the communication based on the intent,
7 producing a predicted response;
8 preparing a response to the communication, producing an actual
9 response; and
10 comparing the actual response and the predicted response to improve
11 subsequent predictions.

1 57. The computer-readable medium of claim 56, wherein the step of
2 comparing the actual response and the predicted response occurs in real time.

1 58. The computer-readable medium of claim 56, wherein the step of
2 comparing the actual response and the predicted response occurs off-line.

1 59. A computer-readable medium having embodied thereon a program, the
2 program being executable by a computer to perform method steps for
3 processing a relationship event, the method steps comprising:
4 receiving the relationship event;
5 analyzing the relationship event to identify concepts in the relationship
6 event;
7 building an event model of the relationship event using the concepts;
8 mapping the event model to models in a knowledge base to produce
9 category scores; and
10 routing the relationship event for action based on the category scores.

1 60. A system for electronic communication management, comprising:
2 means for receiving a communication;
3 means for analyzing the communication to determine intent;
4 means for predicting a response to the communication based on the
5 intent, producing a predicted response;
6 means for preparing a response to the communication, producing an
7 actual response; and
8 means for comparing the actual response and the predicted response to
9 improve subsequent predictions.

1 61. A system for electronic communication management, comprising:
2 a contact center configured to send and receive communications via
3 communication channels including telephone, facsimile, electronic
4 mail, web forms, chat, and wireless;
5 a modeling engine configured to analyze a received communication to
6 determine an intent, and further configured to retrieve data related
7 to the intent;
8 an adaptive knowledge base configured to store models; and
9 a feedback module that compares a response predicted by the modeling
10 engine in conjunction with the models in the adaptive knowledge
11 base and an actual response to the received communication to
12 generate feedback, the feedback being used to update the models
13 in the adaptive knowledge base such that the system learns from
14 each received communication.

1 62. The system of claim 61, wherein the modeling engine gains knowledge
2 from communications on one communication channel and applies the
3 knowledge to communications on another communication channel.

Please add new claims 63-82:

63. A method comprising the steps of:

receiving a communication;

analyzing content of the communication to identify at least one concept
of the communication;

creating a model of the communication using the at least one concept;

comparing the model of the communication to a set of adaptive models to
produce a predicted response to the communication;

preparing an actual response to the communication;

comparing the predicted response and the actual response to produce
feedback; and

using the feedback to modify at least one of the set of adaptive models
such that the set of adaptive models learns with each received
communication.

64. The method of claim 63, wherein the step of comparing the predicted
response and the actual response occurs in real time.

65. The method of claim 63, wherein the step of using the feedback to modify
at least one of the set of adaptive models occurs in real time.

66. The method of claim 63, wherein the step of comparing the predicted response and the actual response occurs while further communications are being received.

67. The method of claim 63, wherein the step of using the feedback to modify at least one of the set of adaptive models occurs while further communications are being received.

68. The method of claim 63, wherein the content of the communication is expressed in a natural language.

69. The method of claim 63, wherein the content of the communication includes natural language and metadata.

70. The method of claim 63, wherein the content of the communication includes natural language and structured information.

71. The method of claim 63, wherein the communication is a text communication.

72. The method of claim 63, wherein the communication is a voice communication.

73. A system for electronic communication management, comprising:
a contact center configured to send and receive communications;
an adaptive knowledge base configured to store models;
a modeling engine configured to analyze a received communication to
determine an intent, to prepare a model of the communication
based on the intent, and to compare the model of the
communication with the models stored in the adaptive knowledge
base to produce a predicted response; and
a feedback module configured to compare the predicted response with an
actual response to the received communication to generate
feedback used by the adaptive knowledge base to modify at least
one model such that the system learns from the received
communication.
74. The system of claim 73, wherein a human agent produces the actual
response to the received communication.
75. The system of claim 73, wherein the adaptive knowledge base modifies at
least one model in response to each communication received by the contact
center such that the system learns from each received communication.
76. The system of claim 73, wherein the modeling engine is further
configured to determine a plurality of intents in the received communication.

77. The system of claim 76, wherein the modeling engine is further configured to determine an explicit intent and an implicit intent in the received communication.

78. A method for real-time learning, comprising the steps of:
receiving a communication;
creating a model of the communication;
comparing the model of the communication to a set of adaptive models to produce a predicted action in response to the communication;
comparing the predicted action with an actual action in response to the communication to produce feedback; and
updating the set of adaptive models according to the feedback.

79. The method of claim 78, wherein if the predicted action substantially matches the actual action, the feedback is positive and an accuracy rating of a model in the set of adaptive models that produced the predicted action is increased.

80. The method of claim 78, wherein if the predicted action substantially differs from the actual action, the feedback is negative and an accuracy rating of a model in the set of adaptive models that produced the predicted action is decreased.

81. The method of claim 78, wherein if the predicted action substantially differs from the actual action and if a model that substantially matches the actual action exists in the set of adaptive models, then the feedback is negative for a model in the set of adaptive models that produced the predicted action and the feedback is positive for the model that substantially matches the actual action.

82. A method for real-time learning, comprising the steps of:
receiving a communication;
creating a model of the communication;
comparing the model of the communication to a set of adaptive models to
determine a category for the communication;
comparing the determined category with an actual category for the
communication to produce feedback; and
updating the set of adaptive models according to the feedback.